

IN THE SPECIFICATION

Please amend the paragraph at page 4, line 28, through page 5, line 9, as follows:

More specifically, a method of the present invention for controlling water quality in a nuclear reactor comprises, ~~as claimed in Claim 1~~, the steps of: making an amount of iron, which is carried into the nuclear reactor and corrosively eluted from structural material within the nuclear reactor into reactor water, at least twice as much as any one of an amount of nickel, which is carried into the nuclear reactor, and an amount of nickel, which is generated in the nuclear reactor; and limiting an upper limit of concentration value of iron in system water supplied into the nuclear reactor to up to 0.10 ppb. It is preferable to limit, ~~as claimed in Claim 2~~, the upper limit of concentration value of the iron to up to 0.04 ppb.

Please amend the paragraph at page 7, lines 4-11, as follows:

The main source of iron in the BWR plant is nickel base alloy material, which is used for heat-exchange tubes of a feed-water heater, which serves as the main source of nickel, and for the fuel assembly in the inside of the reactor. Accordingly, application of a preliminary oxidation treatment to the existing material ~~as claimed in Claim 3~~ makes it possible to inhibit corrosion and reduce remarkably an amount of nickel generated. This makes an amount of iron at least twice as much as an amount of nickel generated.

Please amend the paragraph at page 7, lines 12-24, as follows:

According to the present invention, introduction of natural zinc into the nuclear reactor water to limit the zinc ion concentration value to up to 5 ppb, ~~as claimed in Claim 4~~, makes it possible to cause an amount of ZnFe_2O_4 in a place other than the surface of coated fuel pipes to become null. It is also possible to inhibit generation of ZnO on the surface of the coated fuel pipes as well as generation of Zn-65 due to ZnFe_2O_4 generated. When the

iron concentration value of supply water is 0.04 ppb, it corresponds to 1/10 of iron amount of supply water in a domestic BWR plant and 1/50 of that in a BWR plant in many foreign countries. In this case, an amount of Zn-65 generated on the surface of coated fuel pipes comes merely to the same extent as in the case where expensive zinc, from which Zn-64 has been removed, is used in the foreign BWR plants, even when natural zinc is used.

Please amend the paragraph at page 7, line 25, through page 8, line 10, as follows:

Carbon steel is used for material for forming pipes and shells of equipment in a nuclear reactor coolant purifying system (hereinafter referred to as the "RWCU system") and the RHR system. Corrosion of carbon steel in the RWCU system during operation of the plant is low which is about twice as much as stainless steel. Water quality is deteriorated upon the plant shutdown, leading to serious corrosion of the carbon steel. In the RHR system, there occurs serious corrosion of the carbon steel in a stand-by condition during operation of the plant. Accordingly, the existing material is subjected to a treatment such as flushing prior to a making up operation to remove iron rust. Such operation and safekeeping decrease an amount of iron flowing from these systems into the nuclear reactor to a negligible extent in comparison with an amount of iron carried from the supply water. Formation of these systems of stainless steel ~~as claimed in Claim 5~~ makes these operations unnecessary.

Please amend the paragraph at page 8, lines 11-16, as follows:

Use of a reactor water high-temperature purifying device having filter medium made of ferrite or ferritic alloy ~~as claimed in Claim 6~~ makes it possible to capture nickel in accordance with a reaction indicated in the following reaction formula (2) to generate

NiFe₂O₄:



It is therefore possible to remove nickel from the reactor water.

Please amend the paragraph at page 8, lines 17-24, as follows:

The main source of iron in the BWR plant is nickel base alloy material, which is used for the heat-exchange tubes of the feed-water heater, which serves as the source of nickel, and for the fuel assembly in the inside of the reactor. Use of ferrite as a corrosion resistant material having a smaller nickel content than the existing material ~~as claimed in Claim 7~~ makes it possible to inhibit corrosion and reduce remarkably an amount of nickel generated. This makes an amount of iron at least twice as much as an amount of nickel generated.

Please amend the paragraph at page 8, line 25, through page 9, line 7, as follows:

A remarkable reduction ~~reducibility~~ of an amount of nickel makes an amount of iron generated at least twice as much as an amount of nickel due to existence of ferrite, which is generated through corrosion of stainless steel in the reactor, even when iron concentration of the supply water decreases to become null. In such a case, it is preferable to reduce the iron concentration of the supply water as low ~~lower~~ as possible. An iron removing device as ~~claimed in any one of Claims 8 to 11~~ is required to make the iron concentration of the supply water null. The condition for making an amount of iron generated at least twice as much as an amount of nickel may exist in the intermediate portion between 0.04 ppb as the existing value and zero, depending on an extent of reduction in an amount of nickel generated.

Please amend the paragraph at page 9, lines 8-10, as follows:

With respect to functions required for the high-performance iron-removing device, temperature is a significant factor of ~~in~~ influence on characteristics ~~characteristic~~ of iron and the filter material ~~as claimed in Claim 9~~.

Please amend the paragraph at page 9, lines 11-19, as follows:

Iron Ratio of iron, which is eluted as ions ~~ion~~ from material used for a reactor core structural material such as fuel springs directly into the reactor water under conditions in which an amount of iron carried is minimized[[,]] accounts for about 2/3 of the total amount of iron generated. A technical specification value of cobalt content of the above-mentioned material is up to 0.05 % and an actual value is 0.03 %. Accordingly, reduction in the technical specification value of cobalt content up to 0.01 % ~~as claimed in Claim 12~~ makes it possible to reduce concentration of ionic Co-60 in the reactor water substantially to half.

Please amend the paragraph at page 9, lines 20-28, as follows:

Reduction in an amount of cobalt generated will suffice in order to reduce a CRUD (Chalk River Unclassified Deposit) Co-60 in the reactor water under conditions in which an amount of iron carried is minimized. Under the present circumstances, the Co-base alloys for the turbine blade and the large-diameter valve make up 30% and 40% of the source of cobalt, respectively. Therefore, when the Stellite as the cobalt base alloy is changed to nickel base alloy ~~as claimed in claim 13~~, it becomes possible to reduce an amount of cobalt generated to one fourth thereof in the present circumstances.